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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

MM Docket No. 87-268

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

ADVANCED TELEVISION SYSTEMS AND
THEIR IMPACT UPON THE EXISTING
TELEVISION BROADCAST SERVICE

To: The Commission

COMMENTS

Comes now the National Radio Astronomy Observatory, Green Bank, West Virginia (NRAO West Virginia) and by its attorney hereby submits its Comments in response to the Commission's Second Further Notice of Proposed Rule Making, FCC 92-332 released August 14, 1992. In support whereof the following is shown:

1. In its Second Further Notice of Proposed Rule Making, the Commission seeks comments concerning its proposal to establish a Table of Allotments in order to facilitate the implementation of high definition television service throughout the United States. NRAO, an institution specializing in radio astronomy, is operated by Associated Universities, Inc. (AUI), a nonprofit corporation organized in 1946 to establish and operate, with government and other support, large-scale research facilities for the benefit of the interested scientific community. AUI is sponsored by nine major universities: Columbia, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Pennsylvania, Princeton, Rochester and Yale. AUI operates NRAO under a cooperative agreement with the National Science Foundation, an independent agency of the Federal Government concerned primarily with the support and encouragement of basic research, training and education in the sciences, and the interchange and dissemination of scientific information.

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2. NRAO was founded in Green Bank, West Virginia in 1956 to provide scientists with large radio telescopes necessary for the continued advancement of radio astronomy. Its first site was located near Green Bank, West Virginia in order to take advantage of good shielding from man-made radio noise provided by the Allegheny Mountains and is protected from interference by the State of West Virginia and by the Federal Communications Commission which established a radio quiet zone in 1958. Since then, NRAO has expanded its facilities to include a Very Large Array (VLA) near Socorro, New Mexico, and a Very Long Baseline Array (VLBA) with ten radio telescope sites across the United States and its territories from Mauna Kea, Hawaii to St. Croix, Virgin Islands.

3. NRAO operates three major telescope systems at its Green Bank facilities. An 140-foot diameter radiotelescope is used annually by about 250 scientists from 65 institutions and is instrumented to receive cosmic signals at nearly all frequencies between 25 MHz and 25 GHz. The second system consists of an 85-foot diameter telescope, the data from which is combined with those from other telescopes in Florida, Hawaii and Alaska to facilitate the Naval Observatory's timekeeping function. This telescope operates at frequencies of 2.3 and 8.4 GHz for this purpose. When not in use for timekeeping purposes, this telescope monitors radiation from pulsars at frequencies of 327 and 610 MHz. The third system is comprised of two 85-foot diameter antennas united by fiber optic cables into a single radio telescope called an interferometer. It monitors changing signals from approximately one hundred fluctuating radio sources on the frequencies of 2.3 and 8.4 GHz. Although the second and third system do not presently use receivers on frequencies in the UHF spectrum, such use is not precluded in the future.

4. A fourth system consisting of a high performance, fully steerable, large aperture radio telescope is being constructed to replace a 300-foot diameter telescope which collapsed in November 1988. Congress appropriated \$75 million for its construction and when it is completed in late 1994, its frequency range will be from 100 MHz to 50 or 100 GHz. These systems operate 365 days a year. The benefits derived from NRAO's radio astronomy operations are well documented and known to the Commission. *See Achernar Broadcasting Company*, 5 FCC Rcd 962 (ALJ 1990), *rev'd*, 5 FCC Rcd 6309 (Rev. Bd. 1990), *rev'd*, 6 FCC Rcd 5393 (1991), *recon. denied*, 7 FCC Rcd 1778 (1992), *appeal pending sub nom.*, *Achernar Broadcasting Company v. FCC*, No. 91-1516 (D.C. Circuit filed October 21, 1991 and consolidated cases).


5. NRAO West Virginia is concerned that the Commission's proposed HDTV allotments will adversely affect its radio astronomy operations in Green Bank. Specifically, NRAO West Virginia objects to the allotment of Channel 36 in Roanoke, Virginia. Although this allocation is technically outside the boundaries of the National Radio Quiet Zone (NRQZ) (§73.1030(a)), a Channel 36 transmitter could be located sufficiently close to the NRQZ so that its signal would cause deleterious adjacent channel interference to use of Channel 37 in Green Bank which has been reserved exclusively for radio astronomy use. Any allocations of Channels 36 or 38 in or near the NRQZ would likely cause interference to NRAO's radio astronomy observations as well and should be avoided. The Commission must also bear in mind the potential harmful effect that might result from a UHF television allotment in the NRQZ and if any such allotment is made, must, at the very least, require that the television permittee coordinate its operations with NRAO so as to eliminate interference.

For the foregoing reasons, the Commission's HDTV Table of Allotments should be constructed in a manner which will afford adjacent channel protection as well as protection from other UHF interference to the NRAO's radio astronomy operations in Green Bank, West Virginia.

Respectfully submitted,

NATIONAL RADIO
ASTRONOMY OBSERVATORY
(GREEN BANK, WEST
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